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GB 2222243 A GB 2208921 A GB 2208704 A
GB 1188540 A GB 1173819 A GB 1039496 A
GB 0866273 A GB 0468421 A

(58) Field of search
UK CL (Edition J) F4T TC TEC TEE
INT CL[4] F23C, F23D

(54) Gas fire

(57) A burner mixing tube (7) has a gas inlet (1, 2), an air intake (3) and a plurality of gas outlets (8), at least some of which are located at or close to the base of the burner chamber to prevent back ignition. Preferably the chamber (7) is incorporated in a solid fuel effect gas fire which comprises a tray (11), a hollow burner tube (7) located at the bottom of the tray and covered by a layer of refractory particulate material (12) and, on top of said layer, a plurality of refractory bodies (13) simulating coals, logs or similar. Alternatively the mixing chamber may be incorporated in an open fire, stove or connection box and may be U-shaped or rectangular or circular.

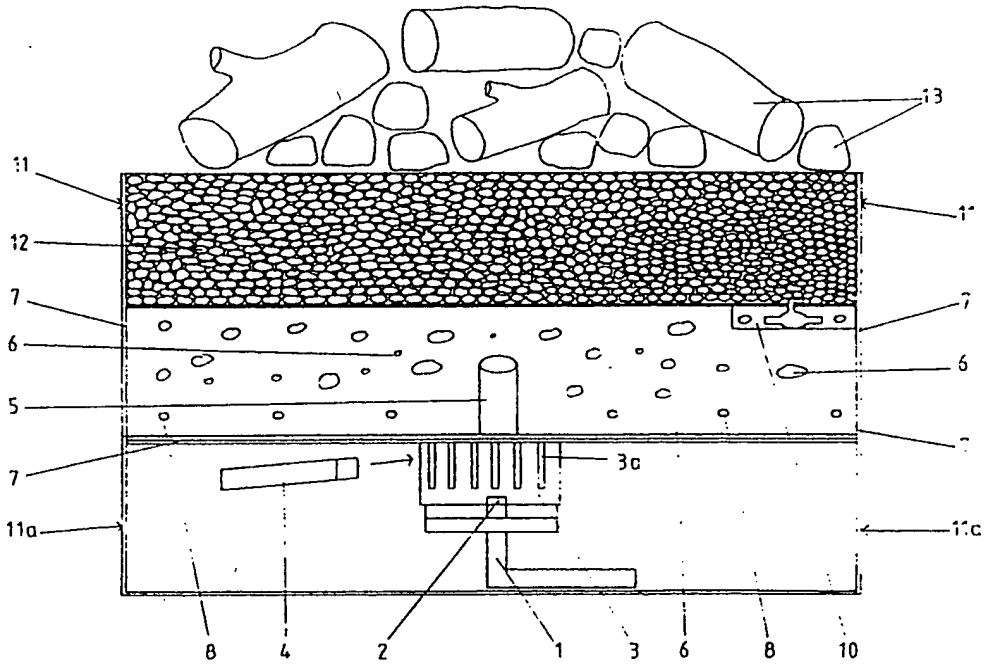

FIG. 2

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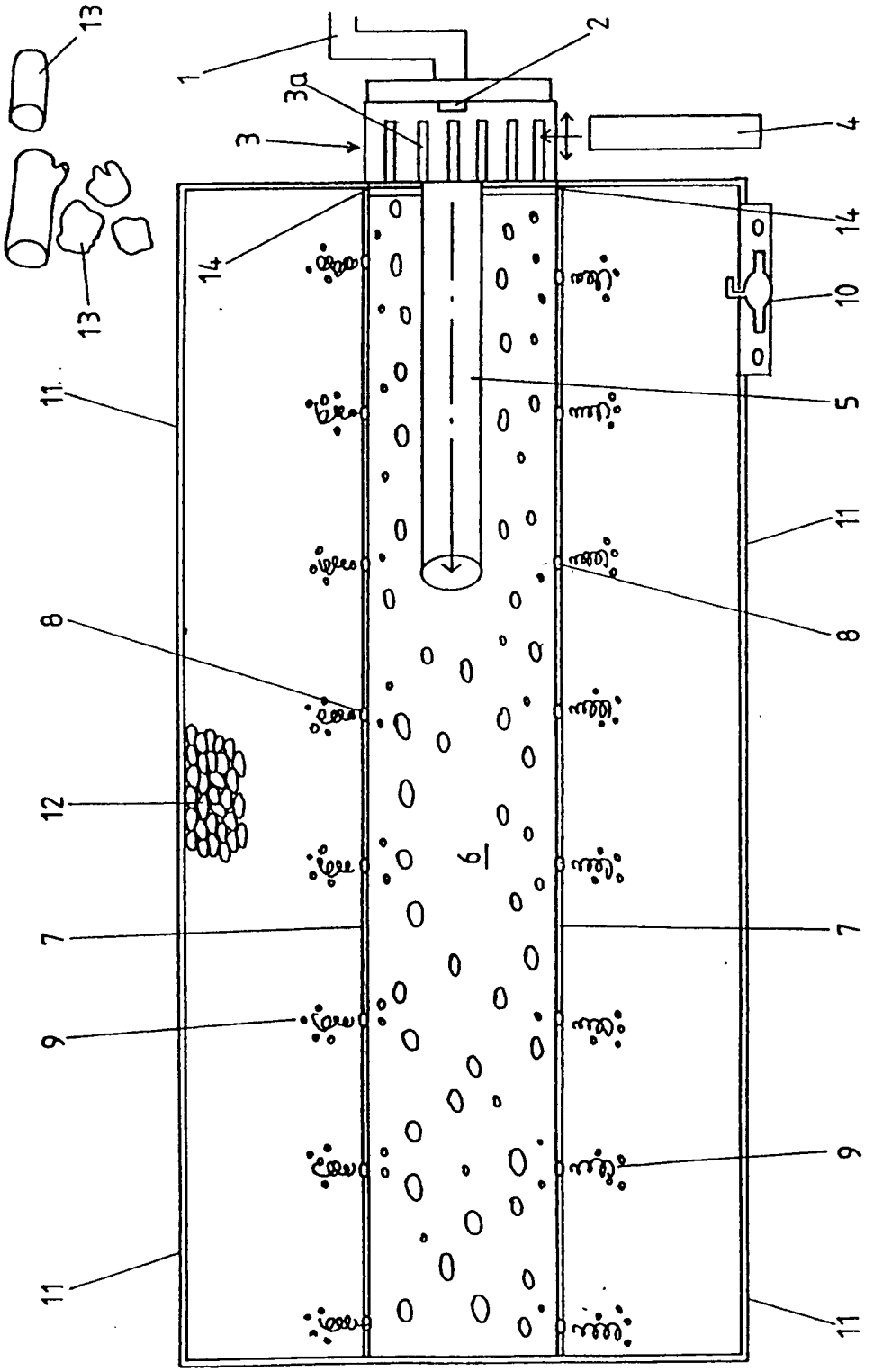

FIG. 1

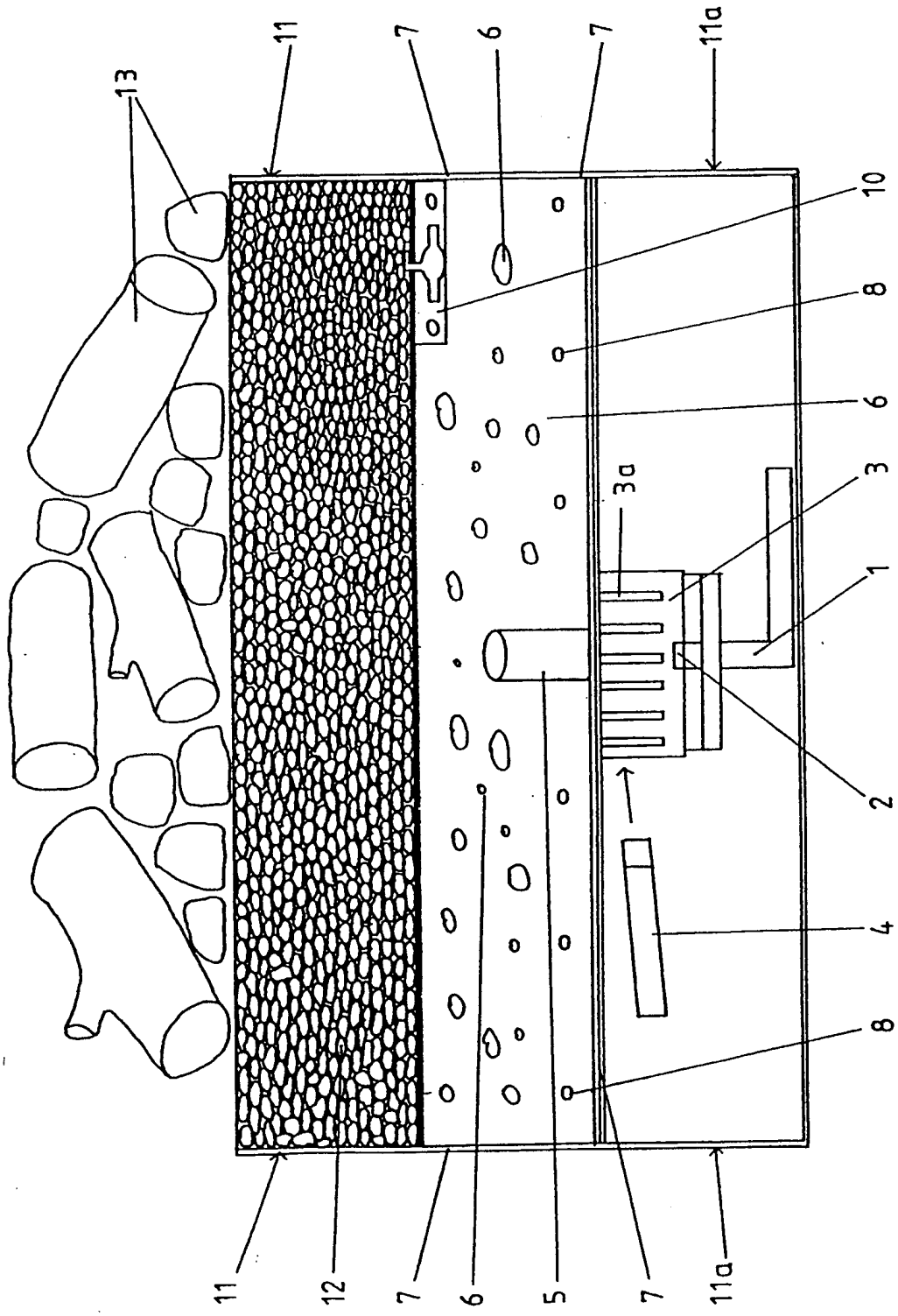

FIG. 2

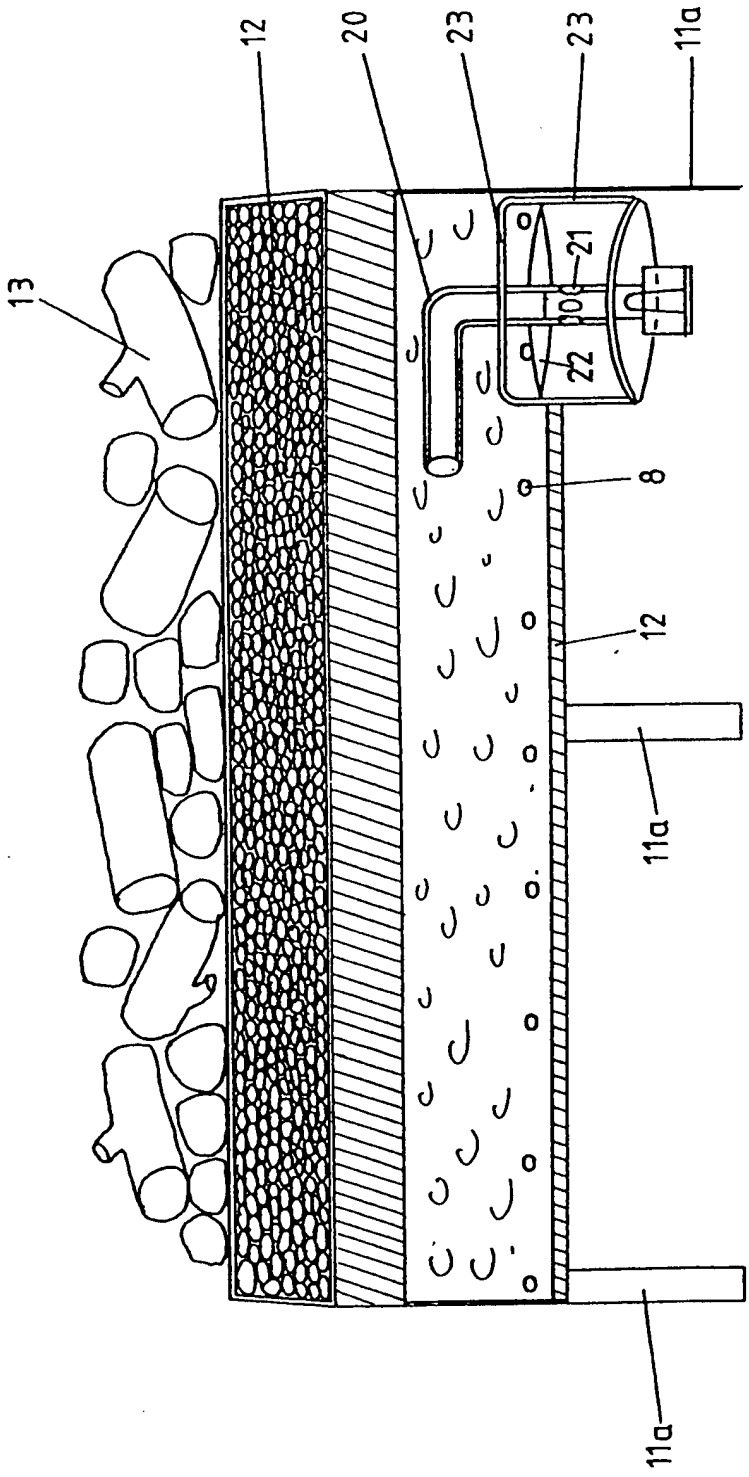

FIG. 3

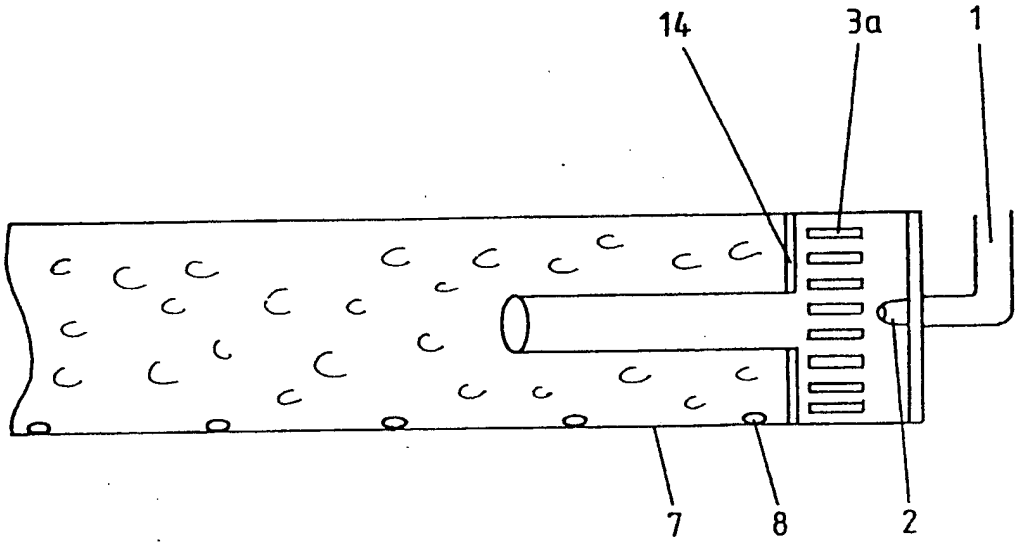

FIG. 4

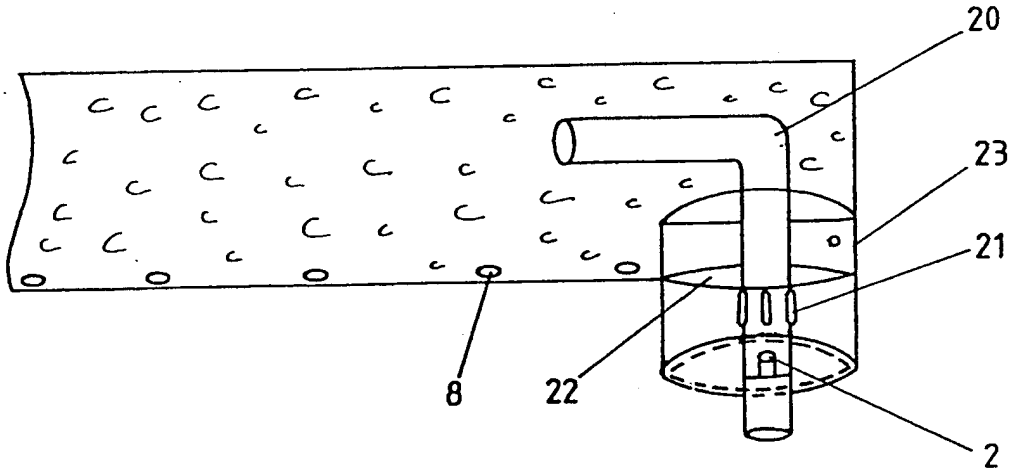

FIG. 5

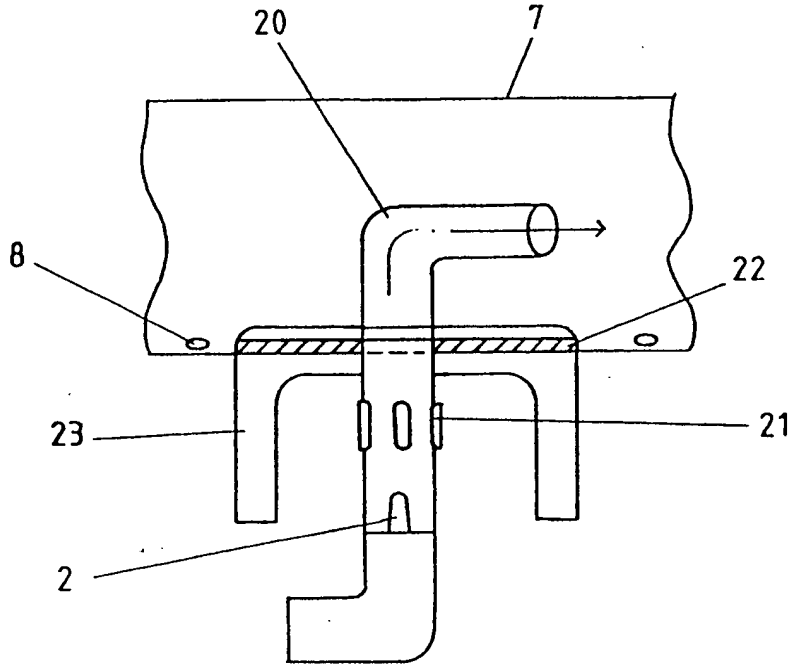

FIG. 6

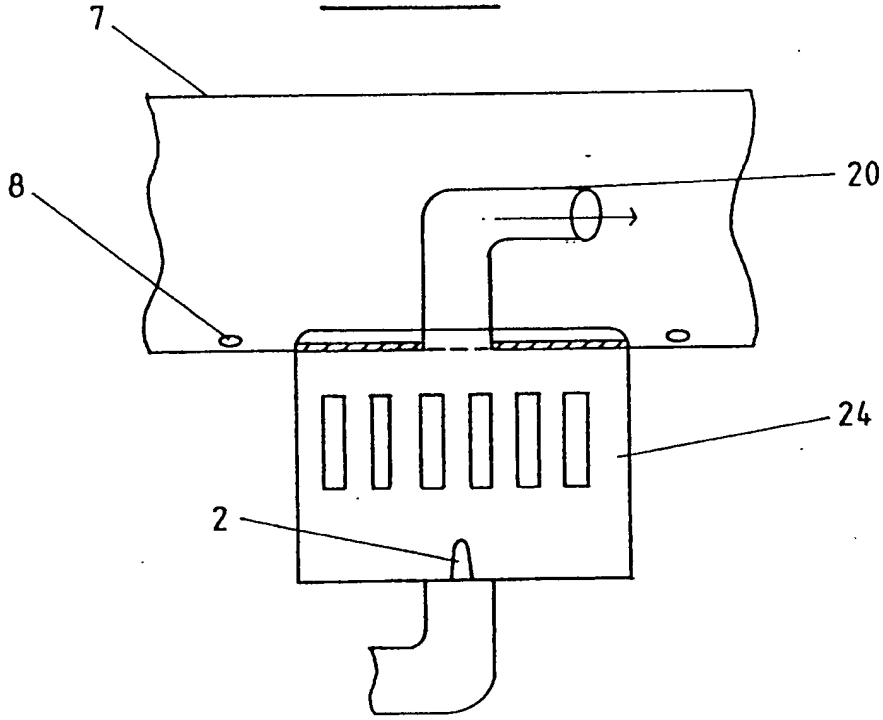

FIG. 7

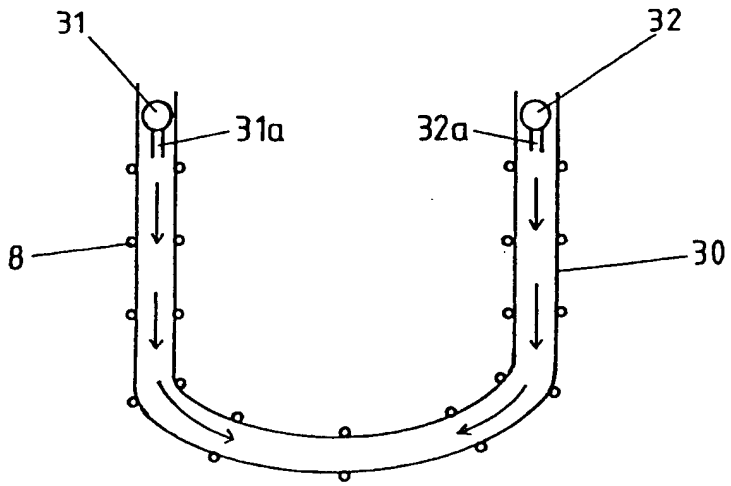

FIG. 8

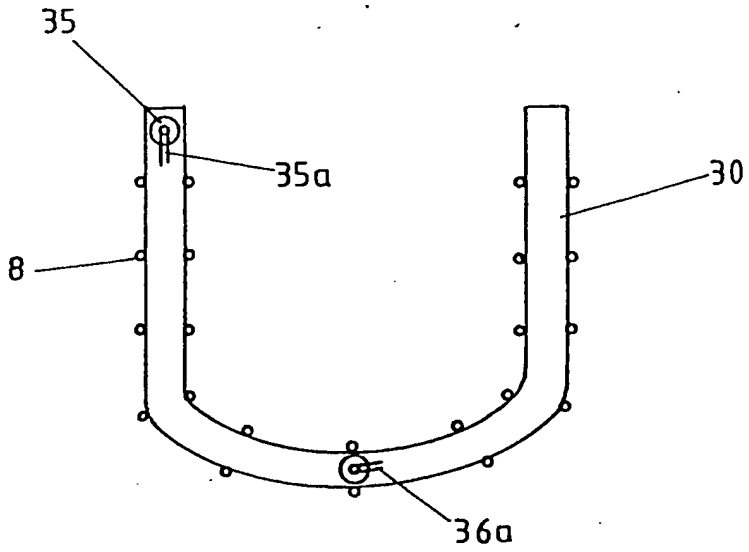

FIG. 9

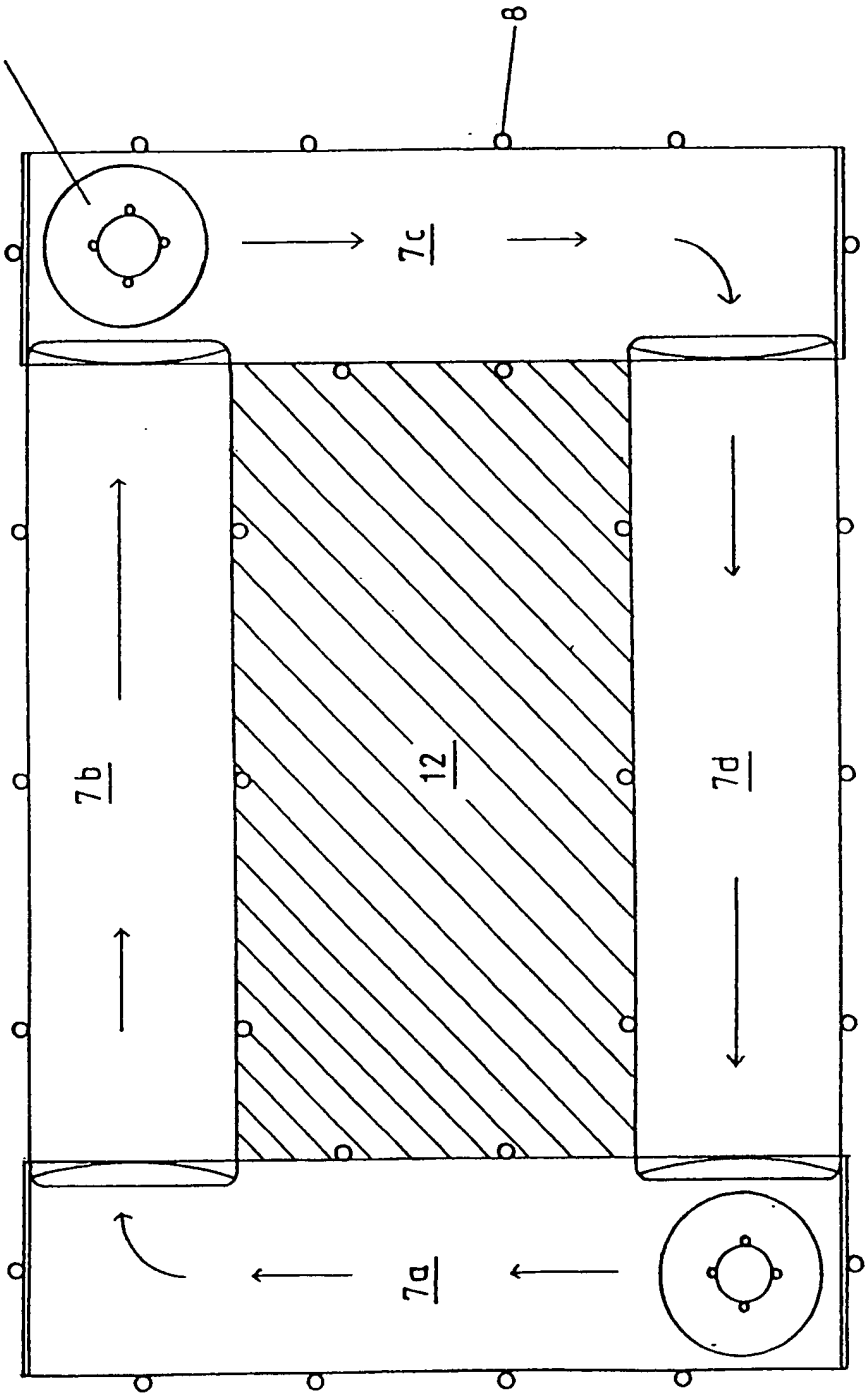

FIG. 10

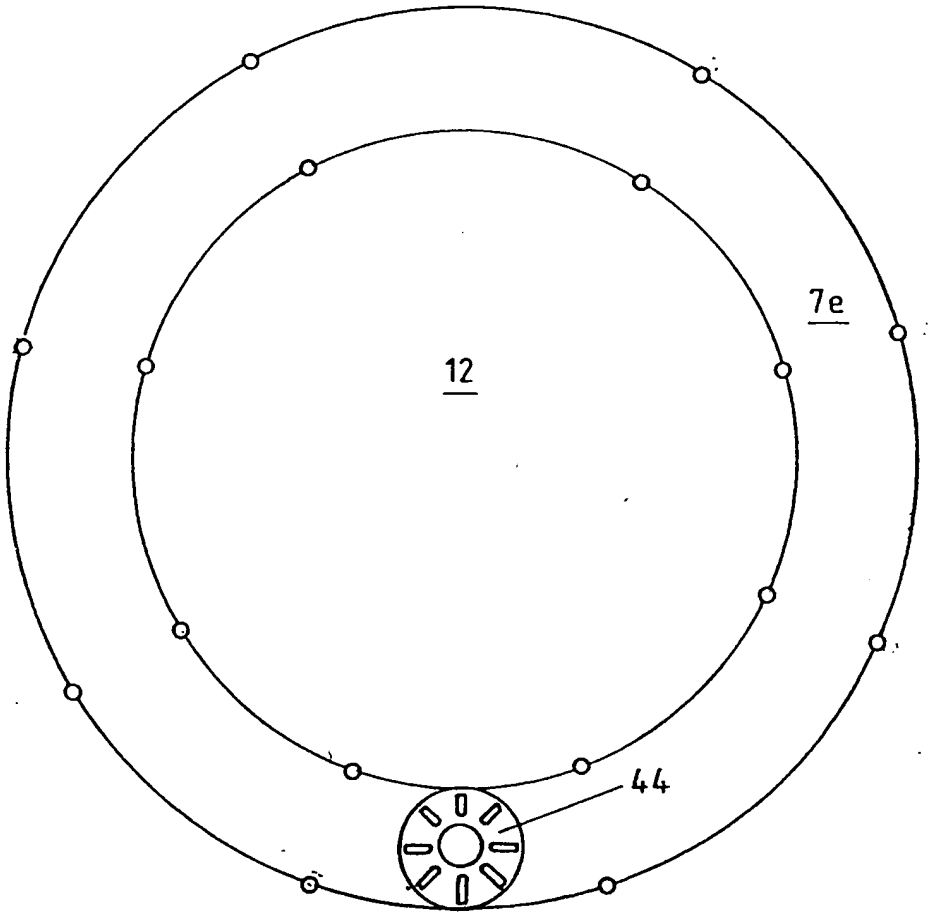

FIG. 11

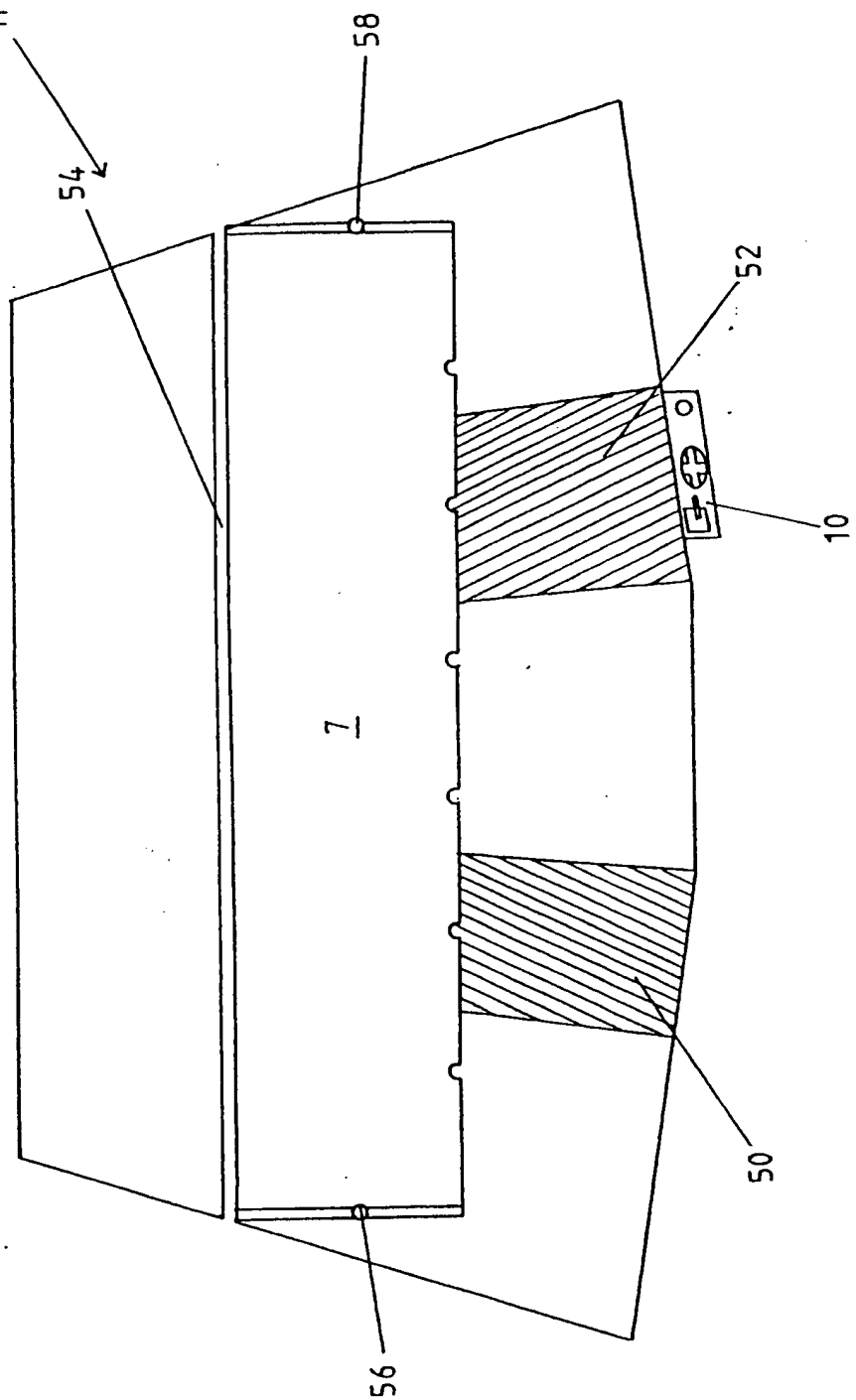

FIG. 12

GAS FIRE

The present invention relates to a gas fire, and in particular to a solid fuel or log effect open gas fire.

Solid fuel effect fires have been known for some time and generally comprise a base or tray which holds refractory particulate material on top of which is placed a number of refractory bodies to represent coals or logs. Gas fed to the particulate material is ignited and burns around the bodies to give a real fire effect.

It has been common practice to increase the efficiency of these fires by mixing air with the gas either in localised areas in the fire, ie secondary aeration, or before the gas is fed to the fire, ie primary aeration. With primary aeration there is a problem of back ignition of gas through the exit ports of the gas burner to the point of gas injection, this being caused by a build up of gas pressure within the particulate material.

It is therefore the aim of the present invention to provide an improved gas fire of the primary aeration type which overcomes this disadvantage.

According to the first aspect of the present invention there is provided a solid fuel effect fire comprising a tray for receiving a layer of refractory particulate material and, on top of said layer, a plurality of refractory bodies representing coals and/or logs, a burner disposed within said tray underneath said layer of refractory particulate material, said burner comprising a gas inlet and plurality of gas outlets, and means for admitting air to said burner, wherein said plurality of gas outlets are located at or close to the base of the burner.

Preferably, said layer of refractory particulate material is at least 2 inches thick and comprises

insulating material such as vermiculite, perlite or similar. This protects the walls of the burner from the heat of the fire, thus helping to prevent lock ignition.

Advantageously, said gas inlet comprises a small diameter venturi located within said burner, said venturi being of such length that the gas and air mix issuing therefrom is caused to bounce back from the opposite end of the burner, thereby increasing the pressure of gas and air in the burner.

The venturi may be L or elbow shaped to allow other burner heads to be built in at any place in the burner.

The gas and air mixture issuing from the outlets permeates up through the vermiculite to be ignited on the top surface of the tray by a pilot burner with thermal coupling.

According to a second aspect of the present invention there is provided a burner comprising a gas inlet, a plurality of gas outlets, and means for admitting air to said burner, in which said gas outlets are located at or close to the base of the burner.

The burner, which can run on natural gas of LPG, is designed to be a free standing open fire or can be fitted in a closed stove, convection box, or central heating stove. In a closed stove, it is designed to burn clean without sooting and could be used in Class 1 or Class 2 chimneys.

When the gas is first ignited, it burns for about 10 minutes with blue flames which then turn to yellow and organge as the artifcial coals/logs heat up.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Fig 1 is a plan view of a first embodiment of the invention, incorporating a horizontal burner,

Fig 2 is a side view of a second embodiment of the invention, incorporating a vertical burner,

Fig 3 is a side view of a third embodiment of the invention, showing an alternative positioning of the burner.

Fig 4 is a side view of the burner head of the embodiment shown in Fig 1,

Fig 5 is the side view of the burner head of the embodiment shown in Fig 3,

Figs 6 to 9 illustrate various different arrangements of burner heads,

Fig 10 illustrates an alternative embodiment in which there are four burner tubes and two burner heads,

Fig 11 illustrates a further alternative embodiment in which there is a single circular burner tube with one burner head,

Fig 12 illustrates modifications to the burner tray. Referring to Fig 1, a gas fire in accordance with the present invention comprises a tray 11 which accomodates a burner 7 in the form of a hollow tube or box section of steel, iron or ceramic material. Each end of the burner 7 is closed and the burner includes two rows of holes 8 which act as gas outlets and are located at or close to the base of the burner. This particular location of gas outlets helps to prevent back ignition of the gas through the outlets 8 to the burner head.

Gas is fed to the burner head through inlet 1 and jet 2, where it passes along venturi 5. Air is admitted through air intake 3 which comprises a series of slots 3a, so that a gas and air mixture issues from the venturi 5 to fill the burner 7. The air intake 3 can be regulated by a sliding plate 4 which can be moved over the slots 3a as required.

A layer of refractory particulate material such as

vermiculite 12 covers the burner 7, and the gas is forced to rise up through the vermiculite to be ignited on top of the fire by means of a pilot burner with thermal coupling (see reference numeral 10). Ceramic fibre coals or logs 13 are placed on top of the vermiculite to simulate a solid fuel fire.

By providing sufficient depth of vermiculite, ie at least 2 inches, the burner 7 is prevented from getting too hot due to the insulating effect of the vermiculite, and this prevents back ignition.

Also, the venturi 5 is extended some way along the burner 7, so that the gas and air mixture will be caused to bounce from one end 15 of the burner to the other end, thereby building up pressure and forcing the mixture out of the holes 8. The gas and air mixture in the burner 7 at any one time is prevented from entering venturi 5 by the fact that the pressure of the new gas/air mixture issuing from the venturi is greater than the pressure already in the tube.

An end plate 14 holds the venturi 5 in position and prevents back pressure getting out of the air intake or into the gas jet 2. This burner head is shown in more detail in Fig 4.

An alternative embodiment is shown in Fig 2 in which the tray 11, burner 7, vermiculite layer 12, and coals/logs 13 are the same but the burner head is located centrally of the burner tube 7 with the venturi extending vertically into the tube 7. The gas inlet in this embodiment is elbow shaped with the jet 2 vertically above the inlet 1. Also, the tray 11 stands on legs 11a with the burner head being accommodated in the space between the tray and the bottom of legs 11a.

Referring now to Figs 3 and 5, an alternative arrangement of burner head comprises a elbow shaped venturi

20 which has integral air intake slots. The horizontal part of venturi 20 extends horizontally along tube 7 as in Fig 1, but the vertical part of the venturi protrudes from the base of tube 7 where it is held in place by a sold plate 23. Air is drawn in through slots 21 which are surrounded by housing 23. Again, gas is fed into the venturi along gas inlet 1 and jet 2.

Figs 6 and 7 illustrate slightly different air intake mechanisms. In Fig 6, the housing 23 is solid and surrounds slots 21 in the venturi itself, as in Fig 5. In Fig 7, the housing 24 is slotted and forms an interconnecting chamber between jet 2 and venturi 20.

Fig 8 illustrates a U shaped burner tube 30 again supplied with holes 8 near its base. Two burner heads 31, 32 are provided with their venturis 31a, 32a pointing towards each other. The same arrangement of burner tube 30 in Fig 9 has one burner 35 at the end of the U and a second burner 36 at the centre of the U, with their respective venturis 35a, 36a both pointing towards the other end of the U.

Fig 10 illustrates an embodiment in which there are 4 interconnecting burner tubes 7a, 7b, 7c and 7d which together form a rectangular arrangement of burner tubes. Two burner heads 40, 42 are illustrated, located at opposite corners of the rectangle, but there could be a total of four burners, one at each corner. Here the vermiculite fills the centre of the rectangular burner arrangement and also covers the burners to a minimum depth of 2 inches.

Fig 11 illustrates a circular burner tube 7e with a single burner head 44. Again, vermiculite 12 fills the centre of the burner tube and covers the tube to at least 2 inches, as in all of the other embodiments.

It should be appreciated from these examples that the

burner tubes may be in any desired shape and arrangement, and can be fitted in trays of the same of different shape.

Similarly, the arrangement and number of burner heads can be varied as required.

Referring now to Figure 12, this illustrates some modifications to the burner tray 11. Two pieces of stainless steel gauze 50 and 52 are located under the vermiculite, to bring the gas to the front of the tray more easily. A piece of steel 54 is located at the rear of the burner, to stop gas going to the rear of the tray, and extra holes 56, 58 are provided, one at each end of the tube. The pilot 10 is located adjacent one of the steel gauze pieces, 52.

CLAIMS

1. A solid fuel effect fire comprising a tray for receiving a layer of refractory particulate material and, on top of said layer, a plurality of refractory bodies representing coals and/or logs, a burner disposed within said tray underneath said layer of refractory material, said burner comprising a gas inlet and a plurality of gas outlets, and means for admitting air to said burner, wherein at least some of said gas outlets are located at or close to the base of the burner.

2. A fire according to Claim 1, in which the tray is sufficiently deep to receive a layer of refractory particulate material at least two inches thick.

3. A fire according to Claim 1 or Claim 2, in which said gas inlet comprises a small diameter venturi located within the burner, said venturi being of such length that the gas and air mix issuing therefrom is caused to bounce back from the opposite end of the burner, thereby increasing the pressure of gas and air in the burner.

4. A fire according to Claim 3, in which the venturi is "L" or elbow shaped.

5. A burner comprising a gas inlet, a plurality of gas outlets, and means for admitting air to said burner, in which at least some of said gas outlets are located at or close to the base of the burner.

6. A fire according to Claim 1 and substantially as herein described.

7. A sold fuel effect fire, substantially as described herein and illustrated in the accompanying drawings.

8. A burner according to Claim 5 and substantially as herein described.

9. A burner substantially as herein described, with reference to the accompanying drawings.

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